NPDES Report for the Period January 1 to December 31, 1999
Pierce County, Washington
March 1999

This report describes the ongoing activities of Pierce County in fulfillment of the requirements of the National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for discharges from municipal separate storm sewers for the South Puget Sound Water Quality Management Area, and the portion of the Kitsap Water Quality Management Area located in Pierce County.

Assessment of Stormwater Program Needs

As mentioned in the 1998 and 4th year reports, the County embarked on an ambitious schedule of basin planning in 1999. By the end of the year, three consultants had been retained, and three staff members assigned to begin the first plans. These will take place in the Clover-Chambers, Muck Creek, and Gig Harbor basins. Community plans are underway in the Midland-Spanaway area (Clover-Chambers basin), and the Gig Harbor area, with a possibility of a plan starting in the Graham (Muck Creek) area. We noted the advantages of running these two processes simultaneously to take advantage of public meetings, and provide good information to the community planning efforts to aid in proper location of amenities, land uses, etc. Two more basins are scheduled to be assigned to staff by the end of 2000. All of the basin plans being prepared will have stormwater needs components associated with them. A copy of the draft **Basin Planning Guidance** document was provided with the 4th year report. Money expended on this effort in 1999 amounted to $190,995.

We also recognized the overlap of parts of these efforts with our ESA planning efforts. We currently have a draft document prepared in 1999 that examines County regulations and activities, and provides input on what needs to be altered or added to protect fish. It is anticipated this document will be completed in mid-2000.

Capital Improvement Program

The CIP Program spent $4,445,867 on projects, property acquisitions, contracts, and associated support in 1999. Personnel additions brought the CIP group to 11 FTE. An additional Civil Engineer 2, Civil Engineer 1, Fish Biologist, and Engineering Techs 2 and 3 are being hired in 2000. Table 1 outlines the CIP projects and expenditures for 1999.

River Activities

Land Acquisition

Four separate riverine land parcels were purchased for a total purchase cost of $291,328. One of the parcels contained an existing house structure which demolished and hauled away as part of the acquisition. The parcels will be kept as permanent open space and allowed to revert back to natural conditions.

The County also received a Community Development Block Grant to acquire properties in the urbanized areas that were prone to flooding. In 1999, 7 properties were acquired at a cost of $449,000.

Setback Levees
Design and planning of two setback revetment projects occurred throughout 1999. The Larson Revetment (500-ft long at river mile 24.8, left bank) and The Country Revetment (3,500-ft at river mile 26.5, left bank) projects are both being funded by the Army Corps of Engineers, Seattle District via federal congressional legislation.

Much coordination work for the project(s) continues to be done with the Corps, Puyallup Tribe and the State Department of Fish and Wildlife. The Country Revetment is currently in the hearing process for the shoreline substantial development permitting. The Corps is presently preparing the environmental and biological analysis report documents as part of the 404 and Section 7 Consultation review processes.

Construction is not anticipated to commence until July 2001 on the two projects.

Floodplain Map Modification
Work continued on the floodplain map modification project. This project is the result of FEMA designating the county as a Cooperating Technical Community (CTC) and awarding a grant in the amount of $40,000. The project will allow the county to update its current community floodplain mapping using much more accurate base topographical mapping the county recently produced as part of its ortho-photo mapping project. The extent of the new floodplain boundaries changes are not yet determined. The project will continue through January 2001.

Levee Vegetation Committee
We continued participation on the State Levee Vegetation Committee, which is moderated and lead by the WDFW. The primary goal and objective of the committee is to develop river levee vegetation standards for two geographical regions of the state (west and east sides). The desired result is to allow for significantly higher densities and diversity of vegetation on levees for enhancement and protection of fish and wildlife habitat, water quality improvement, respective to temperature and total suspended solids (TSS).

The issue currently not allowing such goals of vegetation levels is primarily due to the Army Corps of Engineers PL 84-99 Levee Maintenance Program. The program requires that local sponsors eradicate all vegetation that is greater than 2-inches in diameter. Therefore, local sponsors are forced to minimize any vegetation that would otherwise be a significant natural and beneficial function for habitat and water quality. This committee has been convening and working

towards a solution for the past 3 to 4 years and is still continuing with this effort in achieving the goals and objectives.

Another goal of this committee is to try and resolve the unique conundrum of Pierce County relating to management conflicts between governments and agreements. In agreements negotiated with the Tribal Nations, larger trees are to be left for the benefit of fish, and this is in conflict with the Corps policy. This problem was highlighted when Pierce County lost numerous levees, and the Corps refused to authorize funds for rebuilding, stating that maintenance standards had not been met. This issue is still unresolved.

Fish Passage Committee

Pierce County Water Programs is also a participant in the Fish Passage Culvert Committee. This committee is moderated and steered by the Pierce County Conservation District, and includes representatives from the Puyallup and Muckleshoot tribes, Fish and Wildlife, King and Pierce Counties, Champion International, and private consulting biologists. The primary objective of this committee is to identify, inventory, catalog in a database, and prioritize existing culverts within the Puyallup River Watershed. Each identified culvert is then reviewed for fish passage blockages. As culverts are found to be fish blockages, the culvert is prioritized with a priority index.

The highest prioritized culverts yielding the most effective habitat for the cost are then put on a list for funding as funding programs become available. Currently, Pierce County is now the Lead Entity for the Clover/Chambers and Puyallup Watersheds. The role of this entity is to solicit projects for funding consideration as well as to further ranking. Funding sources may come from several state and federal agencies, however the State Salmon Recovery Funding (SRF) Board has been the main source to date.

Pierce County is currently soliciting for various salmon recovery projects. These projects may entail fish passage culverts, land acquisitions, bank protection, setback levees, etc. A final list of ranked projects to be funded for construction (and approved by the SRF Board) should be completed by April 2000.

Effectiveness measures of the actions included under this section are very tangible in many instances. The tribes have been very positive about construction of setback levees. In storms occurring in November 1999, the river was breaching old levee areas (where it was removed this summer) and flowing into the new meander areas. The removal of houses as part of the setback projects has removed pollutants, farm animals, and septic tanks from the floodplain, as well as taking these properties out of an expensive cycle of repetitive loss. The same can be said of our purchase of houses and property in the urban stream regions. These also have the added benefit of giving us room for future flood control or fish projects in areas where the creekside habitat has been built out for many years.

Salmon Recovery Grant Program – State Interagency Committee for Outdoor Recreation

The purpose of this grant is for the acquisition of riverine floodplain property to protect and preserve salmon habitat within the riverine riparian corridor. The grant funding amount is $1,600,000. The project commenced in 1999 and will continue through October 2000.

Two acquisition sites along the Carbon and Puyallup Rivers have been identified for such land acquisitions. The identified sites were chosen through a coordinated process between the Puyallup Tribe of Indians, Port of Tacoma, Pierce County, and private independent fish biologists. The subject sites were also selected from the tribes salmon habitat land acquisition catalog.

Acquisitions along the Carbon River include five separate parcels for a total area of 37 acres. The location is along the right and left banks of the river between river miles 0.6 and 1.4. Acquisitions along the Puyallup River include ten separate parcels for a total area of 140 acres. The location is also along the right and left banks of the river between river miles 22.2 and 22.6.

Protection and preservation of salmonid fish habitat will result thereby providing needed fish overwintering, refuge and rearing habitat. Eventually, the acquired floodplain land may be opened up by removing and setback the existing levee allowing natural river meander and migration within the floodplain corridor.

Riverine Area Clean-up

The County routinely removes 30-50 tons of garbage, tires, old cars, etc. that have been dumped along the levees. In 1999, and additional large cleanup project was added to this task. The Del de Rio Mobile home park was completely destroyed in the November 1996 floods of the Puyallup River system. The owners never had the property cleaned up after the flood, and ceased to pay taxes on the property, thus beginning a process by which the County can claim the property via tax title. This process is not yet completed. In the meantime, the site became an illegal dumping ground, a home for transients, and a scavenging yard for those who wanted metals to sell for scrap. All of this was happening very close to an elementary school. The County made the decision to clean up and close off the property for the health and safety of local citizens. This clean up was accomplished in 1999 at a cost of $69,461.

Watershed Planning

1. During 1999 the KGI Action Plan was completed and presented to the public at a formal public meeting. The plan is now moving through the approval phase by all those identified in the plan. The initial implementation phase has also begun. This includes forming the KGI Watershed Council. Approximately $100,000 was expended last year on this project.

2. The assigned Watershed Planner working with the Chambers Clover Creek Watershed Committee has been working toward Pierce County Council and County Executive sign off during 1999. In addition he has been working with the committee to form a permanent Watershed Council. Approximately $13,500 was expended last year on this project.

3. The Upper Puyallup Watershed Characterization was completed in 1999. Approximately $20,000 was spent last year on this project.

4. The Upper Puyallup Watershed Committee was formed and the initial steps were taken to begin the Action Plan. The Education phase was completed during 1999. Approximately $100,000 was spent last year on this project.

5 A Watershed Coordinator for the Puyallup River Watershed Council was hired in late 1998. He has formalized their governance issues, expanded attendance, gained and help build the reputation of the Council and has worked with their fish and wildlife committee to address salmon recovery issues. Approximately $50,000 was expended on this project last year.

6 Shellfish harvesting beds have been closed in areas with water quality problems causing this section to coordinate efforts to address this problem. Two on-going committees are meeting with field crews investigating sources of pollution. Approximately $10,000 was expended on this project last year.

7. A small portion of staff time has been spent on ESA topics and issues. Approximately $10,000 was expended on this project last year.

Controlling Runoff from New Development and Redevelopment

The Development Engineering Section is responsible for ensuring that development and redevelopment occurs in accordance with the requirements of the County's Stormwater Management and Site Development Ordinance. During 1999, the Development Engineering Section maintained the following staffing in an effort to meet the ordinance requirements:

A) We employed four CEII plan reviewers who reviewed the designs of proposed road, storm drainage, clearing, and impervious surface type-projects for compliance with the County's Stormwater Management and Site Development Ordinance. Forty percent of their time was spent implementing the ordinance requirements.

B) We employed one ET III plan reviewer and one CEI plan reviewer who assisted and worked under the direction of the CEII plan reviewers. Fifty percent of their time was spent implementing the ordinance requirements.

C) We employed three and one-half ETIII inspectors who performed erosion control inspections and permanent BMP inspections on road, storm drainage, commercial, subdivision, and industrial-type developments. (One ETIII inspector spends half of his time on road, storm drainage, commercial, subdivision, and industrial-type developments and the other half on single family construction.) Forty percent of their time was dedicated to implementing the ordinance requirements.

D) We employed two and one-half ETIII inspectors who performed erosion control inspections on single family home construction. One hundred percent of their time was dedicated to implementing the ordinance requirements.

E) We employed one CEII engineer to handle violations and complaints related to stormwater erosion, filling, and flooding. This employee spent one hundred percent of his/her time pursuing violations of the ordinance.

F) We employed one ETIII inspector to investigate and document potential violations of the ordinance requirements. One hundred percent of this inspector's time was spent on ordinance violations.

We employed one ETIII counter technician to assist single family building permit applicants in implementing necessary storm drainage and erosion control BMPs that are a requirement of the ordinance. Fifty percent of this position's time was spent on these issues.

G) We employed two OAII office assistants and one part time OAII office assistant to provide support for CEII, CEI, and ETIII staff. Forty percent of their time was spent providing support to staff for issues relating to ordinance implementation.

H) We employed one Development Engineering Supervisor. The supervisor was responsible for directing staff in the implementation of the ordinance. Approximately thirty percent of the supervisor's time was spent on issues related to ordinance implementation.

I) We employed one engineer on an extra hire basis to review plans. Forty percent of this position's time was spent implementing the ordinance.

J) We retained four engineering firms to assist in plan review. One hundred percent of these firms' time was spent implementing the ordinance.

The Development Engineering Section expended approximately $700,000 during 1999 implementing the Stormwater Management and Site Development Ordinance. This figure differs (is lower) from the original estimate in the SWMP because we have now developed accounting procedures which allow us to keep

track of just NPDES related costs. Development Engineering's expenditures implementing the new ordinance will continue to increase in future years as vested projects are completed and the workload swings to new (unvested) projects.

The Code Enforcement Section of the Planning Department is responsible for investigation and enforcement of numerous County ordinances, and they act as the central clearinghouse for complaints. The Code Enforcement Section supports implementation of the Stormwater Management and Site Development Ordinance by fielding and documenting complaints pertaining to storm drainage, erosion, sedimentation, and flooding. The Code Enforcement Section employed five employees in 1999. One employee spent twenty-five percent of his/her time receiving and documenting complaints pertaining to ordinance violations. In 1999, the Code Enforcement Section expended approximately $9,000 supporting the Development Engineering Section in enforcement of the ordinance requirements.

In 1999, approximately 3,900 site development permits were approved. A site development permit is required whenever the proposed construction triggers certain thresholds for amount of clearing, amount of excavation, or amount of proposed impervious surface. These 3,900 permits covered projects as small as erosion control for single family home construction on up to stormwater conveyance, quantity, and quality facilities for subdivision or commercial project construction. A total of approximately 6,050 inspections on permitted projects were performed. This number reflects erosion control inspections, storm drainage system (conveyance, quality, quantity) inspections, and excavation inspections for single family, subdivision, commercial, and industrial project. These 6,050 inspections can be further characterized as follows:

- Approximately 4,553 of these inspections were associated with projects permitted under the County's new Stormwater Management and Site Development Ordinance.

- Approximately 3,858 of these 4,553 inspections were associated with single family residential construction for both temporary erosion and permanent drainage provisions. The remaining 695 were associated with commercial, industrial, short plat, formal plat, and large lot projects.

- Approximately 3,242 of the 4,553 total inspections required in association with the County's new Stormwater Management and Site Development Ordinance were of temporary drainage and erosion control measures. The remaining 1,311 inspections pertained to permanent site grading, drainage, and stabilization requirements.

In 1999, the Development Engineering Section received requests to investigate 413 problems/requests pertaining to drainage and erosion control. The following is a breakdown of the nature of these problems/requests:

- 327 Filling and grading.
- 24 - Drainage system failures.
- 11 - Flooding of private property.
- 8 - Flooding related to development.
- 2 - Blocked culvert.
- 2 - Blocked ditch.
- 13 - Flooding over roadways.

26 Special requests from County Council, County Executive, and Planning Director.

Of these 413 problems/requests, forty-four were on permitted sites, and forty-nine were not violations. Currently, these problems/requests are in various stages of resolution. Eighty-eight of these problems/requests have been resolved. One hundred and twenty-three of these problems/requests are still awaiting a field inspection.

To summarize, the amount of staff time dedicated to ensuring that proposed designs for drainage and erosion control met the requirements of the new manual greatly increased in 1999 when compared to 1998. The amount of inspections pertaining to the new manual also greatly increased in 1999. However, the following areas require improvement (and in some cases significant improvement) in order to meet the intent of the manual:

- Maintenance of temporary erosion control facilities on single family residences by contractors/builders.

- The County is still struggling to meet State-mandated turnaround times. In an attempt to meet these turnaround times, the quality of the review, and thus, the quality of the end product is sometimes sacrificed. This situation still exists even with the additional 1999 expenditures for increased staff time.

- There are potentially a large number of violation sites that go unaddressed as we currently only respond to complaints, and there are violations that do not draw complaints.

- Bringing violation sites into compliance.

- Correction of failing storm drainage systems by developers.

- Actual implementation of temporary erosion control measures by contractors in a timely fashion, especially when inclement weather is due.

- Preventing contractors from flushing exposed aggregate slurry into storm drainage systems.

- Preventing utility companies from damaging roadside bioswales.

Groundwater and Shellfish Protection

The Tacoma-Pierce County Health Department's Source Protection Program sponsored a number of activities in 1999 relating to groundwater and shellfish protection. These activities are described as follows:

- The Source Protection Program conducted a Recreational Shellfish Program in 1999 with financial and technical assistance from the Washington State Department of Health. Activities conducted included public education and Paralytic Shellfish Poison (PSP) monitoring and notification. Program staff continued participation in an innovative and collaborative effort, initiated by the Washington State Department of Fish and Wildlife, to better work with and educate the Asian-Pacific-Islanders (API) community on recreational shellfish issues. This work included hiring a number of API youths to assist with PSP monitoring and educating the community about general shellfish issues. **FTE:** 0.15 **COSTS:** $7,200

- In its second full year of operation, the On-Site Sewage Operation and Maintenance (O&M) Program now has more than 5,000 on-site sewage systems in the program. These included single- and multi-family residences, community systems, commercial buildings, and food service establishments. System as-built drawings, brochures and other information has been distributed to system owners and users as part of a program to increase awareness of septic system issues. Staff are working on a grant application that, if awarded, will help increase coverage of the program. **FTE:** 1.8 **COSTS:** $125,000

- The Source Protection Program continued developing a map of Wellhead Protection Areas for land use management and spill response purposes. The information was entered into Pierce County's GIS system, *Countyview*, in December and is now available to all the county departments. Approximately half the wells in the database have been located, using a GPS unit, to within one meter of their true location and work continues to accurately locate the remaining wells. **FTE:** 0.3 **COSTS:** $18,000

- The Source Protection Program conducted a bathing beach sampling program during the summer of 1999 to assess health concerns to swimmers at seven public swimming beaches. Sampling was conducted every other week over most of the summer for water temperature, pH, conductivity, fecal coliform concentrations, number of water fowl present, and number of swimmers present. The action level used generally followed the Washington Department of Health guidelines, with a recommendation against swimming being issued when the geometric mean value of 15 or samples was greater than 200 cfu/100ml or when two consecutive samples exceeded 400 cfu/100ml. The public beach at one lake frequently had high fecal coliform concentrations, leading the Source Protection Program to issue a press release and post signs recommending against swimming.
  FTE: 0.1 **COSTS:** $8,000

- 1999 was a transitional year for the Long-Term Ground Water Monitoring Program. The program continued to record water quality and quantity data from approximately 120 wells throughout Pierce County but there was a change in program lead staff and a program review was conducted. The review concluded that the program is headed in the right direction but that certain changes would be better meet the goals that were identified in the Coordinated Water System Plan. The program is working to incorporate these changes to the extent possible. **FTE:** 1.5 **COSTS:** $120,000

- The Source Protection Program continued working on the Chambers-Clover Management Plan Project. This project, which is being conducted in three phases, will develop a comprehensive water plan for the Chambers-Clover Creek Watershed (WRIA 12). Progress was made in 1999 on the first phase of the project, with the Initiating Governments agreeing on a Memorandum of Agreement and the formation of the committee, the Chambers-Clover Planning Unit, that will develop the plan. The plan will likely take four or five years to complete, provided that funding is available. The project is building upon previous planning projects in the watershed and will work in close coordination with Pierce County's ongoing NPDES permit program, the Endangered Species Act response effort, and the nonpoint pollution control efforts (WAC 400-12). **FTE:** 0.2 **COSTS:** $12,000

- The Source Protection Program continued work on three grants to repair failing on-site sewage systems that are adversely impacting water quality in selected shellfish watersheds. The grants funded 70% of the repair costs, up to $11,000, to repair two failing on-site sewage systems in the Mayo Cove Watershed and three failing systems in the Minter Bay Watershed. The grants are also funding source identification work in the Burley Lagoon Watershed, where three failing systems were identified in 1999. **FTE:** 1.1
  COSTS: $80,000

- Work began in 1999 on development of a program to identify and mitigate sources of fecal coliform in the major shellfish watersheds in Pierce County. The Source Protection Program received partial funding from Pierce County Water Programs for this effort in 2000 and is pursuing grant funding to continue the Shellfish Watersheds Protection Program at least through 2002. The program includes water quality sampling to identify fecal coliform sources, sanitary survey work to identify and correct failing on-site sewage systems, and referral to the Pierce Conservation District of agricultural operations that are adversely impacting water quality. **FTE:** 0.7 (in 1999) **COSTS:** $55,000

Coordinated Water System Plan

During 1999, the Coordinated Water System Plan, Regional Water Demand section, was updated by developing water demand forecasts by individual water service area for those systems located within the County's Urban Growth Area which are required to develop water system plans. Water Programs, in 1999, reviewed numerous water system plans, processed several requests for service area adjustments, processed one "timely and reasonable service" dispute and participated in the community plan effort occurring in the Parkland/Spanaway/Midland community.

Staff has also been participating in the Central Puget Sound Water Supplier's Forum (Forum). The Forum is a cooperative effort of water suppliers and counties formed to address future water supply planning, ESA response, water resource issues and public information needs regarding water supply. Staff also participated in "2514" watershed planning for both the Chambers-Clover Creek WRIA and the Nisqually WRIA. Finally, during 1999 the Pierce County Council authorized the formation of a Pierce County Water Utility to allow Water Programs to continue to pursue the formation of a wholesale water utility for the County, utilizing water rights associated with the County's Chambers Creek Properties. During Fall 1999, Water Programs solicited consultant interest in assisting the County in transferring the County's water rights from industrial to municipal rights, preparing a County water general plan and preparing a water system plan. A consulting firm was selected and a contract was negotiated. Work under the contract will begin in early 2000 and will focus on gathering needed data to obtain a water right change from the Washington State Department of Ecology.

Annexations, Incorporations and Exemptions

In 1999 there were only 3 annexations in unincorporated Pierce. Puyallup annexed approximately 10 acres, Gig Harbor took 20 acres, and Eatonville took less than 50 acres. All three were considered minor, and had little impact to our rate base.

Change in Water Quality Status of Waterbodies

Burley Lagoon (WRIA 15, Burley-Minter basin) was downgraded for shellfish rearing and consumption due to fecal coliform in late 1998, and a shellfish protection district was formed by the cooperating entities (Pierce and Kitsap Counties) in 1999. Chambers Lake continued to be severely impacted by sediments washing down from large scale construction activity with inadequate erosion and sedimentation control in University Place and Lakewood. This lake is located within University Place, but Pierce County owns parkland around the lake , and is therefore interested in its quality. 1998 and 1999 also marked the first time in 15 years of observation that aquatic plants or algae were observed growing on the surface of the lake.

The impact of 4 wheel drive vehicles on the East fork of Rocky Creek (also known as Muck Creek, WRIA 15) has been severe in some areas. Destruction of vegetation, erosion and sedimentation, and disruption of spawning gravels are the most evident effects. Tacoma City Light, Pierce County, and 2 citizens groups worked on the problem throughout 1999, and the problem still persists. Possible permanent solutions which are low in liability and cost, and still allow TCL access to the powerlines for maintenance, are still being sought. The County completed the replacement of a fish-blocking culvert with a bridge in December 1999 at the mouth of Rocky Creek. This opened up over 7 miles of habitat for salmon.

Rocky Bay, which was downgraded for shellfish harvest in 1994, continued to show good results in light of implementation of a water quality CIP project described in our 1998 report, and septic repairs via grants obtained by the Tacoma-Pierce County Health Department. It is expected that the Washington DOH may lift the prohibition in 2000 if saltwater sample results remain low.

Industrial Inspection Program

The number of FTEs in Water Programs that work on drainage investigations, industrial inspection, monitoring and CIP support (one additional engineering technician works almost exclusively on drainage investigation, and maintenance issues) remained at three until May 1999, when one left. An intern was hired to assist during the summer months, until a permanent staff member could be hired in October 1999. The result of having to train 2 new people still meant we were not up to full productivity for May through December. Despite that problem, 60 industrial/commercial inspections were done in 1999, and we expect that number to increase for 2000. Some violations were found and corrected, such as a drywall company discharging wash water from equipment into a tributary of a creek.

The inspectors also responded to at least 35 specific water quality complaints. Inspectors investigated these complaints within 24 hours of the report. Some were found to be serious, such as manure from a topsoil mixing business washing into a shellfish harvesting area. We have found that follow-up on the

more serious cases takes up a large amount of time, thus taking time away from doing more inspections.

Monitoring Program

Flow monitoring continued at Squally Creek (BMP evaluation). Rocky Bay (shellfish closure) sampling continued. The initial emphasis of this project was identification of sources of fecal coliform. However, after completion of the CIP project in late 1998, and septic repairs were done, the question being answered was now "Did these projects do any good?". At the end of 1999, the Department of Health was pleased with the results of fresh and salt water sampling, and anticipated that the prohibition on shellfish harvest might be removed sometime in 2000.

At the end of 1998, Burley Lagoon (WRIA 15) was closed for shellfish harvest. By June1999, Water Programs and Tacoma-Pierce County Health Department staff had created an ordinance authorizing the creation of a shellfish protection district as required by state law. An action plan was also coordinated with a number of entities in both Pierce and Kitsap counties. Pierce County Water Programs agreed to contribute approximately $50,000 per year to the TPCHD to fund a position to work on this closure and begin to take steps in other basins to prevent closures. Water Programs staff also play a coordinating role, and Water Quality staff are responsible for mapping and sampling the County outfalls emptying stormwater into this lagoon. Water quality staff are also surveying the area for possible surface sources of coliform bacteria, while the TPCHD does septic surveys. We will submit the sampling plan to Ecology in the near future.

As mentioned in the 4th year report, monitoring at Heritage Glen (BMP evaluation) was discontinued after the first round of flow monitoring. To reiterate, the structure is certainly moderating flows as it was designed to do, but trying to examine the water quality aspects of the facility via a lysimeter proved to be difficult due to additional flows permitted to come into the pond skipping the water quality pond, additional flows now coming through a rock lined spillway from an area which built out after the pond was established, and anomalies in the bottom of the pond which cause the water to infiltrate before it reaches the lysimeter. Catchbasin monitoring was not begun due to lack of personnel, and Cascadia monitoring was not started because the development still does not have permits and will not allow us to start.

CIP support monitoring remained a much larger part of our mission than we had anticipated. By the end of 1999, the number of groundwater monitoring wells expanded to 31 (from 23 in 1998), read at least weekly in the rainy season, and every two weeks in the dry season. Gauges and wells at ponds require more frequent reading, especially when they are on flood watch. Flow monitoring will become a much bigger part of what we do as the basin plans are being developed. The current plan at the end of 1999 is to establish flow meters in important areas, and when the plan is done, withdraw some of the meters to the

next basin. Some meters will remain permanently in each basin. The consultants will initially be responsible for the maintenance and operation of the flow meters, but when they complete their part of the basin plan, these duties will fall to Water Quality staff.

As required, personnel did an end-of-pipe check on each outfall in unincorporated Pierce County. This was done during the dry season. Please refer to Table 2 for the results of that survey.

Education Program

Most of the resources described in this report can be broken down into three main funding categories. Expenditures for the yard waste collection system and other solid waste programs are not included.

Water Resources Education, Pierce County contribution: $86,225
Washington Department of Ecology Centennial Clean Water Fund: $39,588
Household Hazardous Waste: $137,794

Total: $263,607

Environmental Education Events:

We have 3.5 educators on staff to provide education and resources to Pierce County residents. In 1999, our educators gave classroom presentations, guided field studies, provided consultation services, workshops, and trainings, loaned educational resources and equipment and were invited to community events. A total of 573 of these outreach efforts reached over 15,000 Pierce County residents.

A description of the resources referenced above follows:

CLASSROOM PRESENTATIONS

A selection of environmental presentations were provided for K-12 classrooms, home schoolers, scouts and day camp participants. Each presentation is designed to actively engage students in the topic by encouraging students to discuss the kinds of choices they can make to reduce waste and prevent pollution.

The following presentations were offered:

No Time to Waste

Practical techniques for recycling, precycling (including alternatives to hazardous chemicals) and composting are discussed. Students receive brochures on these topics and teachers are provided with additional curricula and background materials.

Hazards in the Home
This is a new presentation that covers household hazardous products and their alternatives. The presentation was promoted in secondary Home and Family Life classrooms.

Bite of the Finite
A role playing game that introduces students to the finite nature of natural resources. The environmental impacts of raw materials extraction is investigated.

Water We Doing?
This presentation introduces students to water basics--the water cycle in reference to our water use--tracing the path of our household water from aquifer, use, discharge and treatment. Students switch perspective from human to salmon to discover how our everyday activities can affect aquatic wildlife. Students receive handouts and teachers receive curricula on water topics.

Watersheds and You
This interactive program exposes students to the dynamics of land and water that define a watershed. They learn about human activities that affect watershed processes that are vital to our community's ecological health. Students and teachers receive materials on water topics.

ADULT WORKSHOPS
Index of Biological Integrity (IBI)
We held a two day workshop on the IBI method of analysis which uses aquatic organisms to assess the health of streams. Twenty-one participants attended at various points through the two days and included people from WSU Cooperative Extension, the Conservation District, Pierce County Water Programs, the city of Bonney Lake, and the Puyallup Tribe.

Worms Eat My Garbage
This workshop was offered four times in 1999 through Tacoma Community and Pierce Colleges. Each session attracted from 15 to twenty participants who learned how to set up and maintain a worm bin to reduce kitchen waste. In addition to learning about worm bin set up and maintenance, participants were taught green gardening tips to reduce the need for fertilizer, pesticides, and water.

Field Investigations
Because it is easier to teach about the environment when you can get people outdoors interacting with nature, our educators provide opportunities for students, teachers and citizens to participate in field work and stewardship activities. Students learn how to collect and test water samples for a variety of pollutants. They discover how to assess the health of a stream by studying the kinds of aquatic insects they find in it. Stewardship options are also open to adults

through our Citizen Shoreline Inventory program. Volunteers are trained to observe characteristics of the intertidal and upland environment and record the data four times each year.

Puyallup Spring Fair
Exhibits on flooding, green gardening, water conservation, non-point pollution, impervious surfaces, and salmon were set up at the Puyallup Spring fair in April. Educational materials on these and other topics were distributed to the public. In 1999, 91,300 people attended the fair, if only a modest estimate of ten percent walked through the exhibit, thousands of people have been exposed to the information.

The *Green Book*
The third edition of the *Green Book* was printed and distributed in 1999. This directory of environmental education opportunities in Pierce County is becoming known as a valuable resource for formal and informal educators who are planning environmental curricula and are looking for speakers, resources, and field trips. The *Green Book* includes sections on Air Quality, Ecology & Habitat, Resource/Waste Reduction, and Water. Close to 1,500 directories were distributed to schools, libraries and agencies in Pierce County.

Library of Resources
Increasing numbers of teachers, agencies, home-schoolers, college students, and citizens are discovering our library of resources. We loan out books, curricula guides, activity kits, equipment, and models. In 1999, materials were loaned to individuals or groups on 78 occasions.

Educational Website --www.co.pierce.wa.us/enviroed
The website provides a variety of information on nonpoint pollution, alternatives to hazardous products, and green gardening tips. From 1/99 to 6/99 there were 12,622 visits to the site. Visits or "hits" are defined as a collection of requests that represent all the pages and graphics seen by a particular visitor at one time. For example, a visitor may go to one page with 20 graphics and that will register as 21 visits.

Pierce County Solid Waste Newsletter
The newsletter is sent out to 160,000 residences in Pierce County twice each year. In 1999 the newsletters mainly focused on recycling issues, but also provided information on safe disposal of household hazardous products, green gardening techniques, and included an article on the value of building good soils with compost to encouraged infiltration and purification of stormwater runoff.

Household Hazardous Waste Information Line
(253) 798-4115
Our automated phone line gives information on how to safely dispose of hazardous household wastes in Pierce County. In 1999, the phone line was used as a resource by 192 people.

Household Hazardous Waste Management
Pierce County and the City of Tacoma continue to partner in the collection of household hazardous waste. County residents have access to Tacoma's permanent facility. During 1999, the facility collected133,960 pounds of materials from 3,349 residents. Pierce County partnered with Tacoma and the Tacoma-Pierce County Health Department to provide satellite household hazardous waste collection in Eatonville, Orting, and the Key Peninsula.

Yardwaste Composting Program
Pierce County provides curbside collection and self haul options for yard waste. In 1999, the County's contractor processed 39,231 tons of yard debris. In addition to yard waste, the facility is composting a variety of feedstocks including food waste, chicken by-products, waxed paper products, and other organics which are diverted from the waste stream.

Operation and Maintenance of Stormwater Facilities (Water Programs)
This was the second year in which Water Programs operated a facilities maintenance program, so it will be listed here separately from Roads maintenance. This section is also responsible for responding to drainage concerns that are not associated with road concerns or development.

Pond Maintenance
In 1999, 70 ponds received some level of maintenance activity. In the first 2 years of this program, 2/3 of publicly owned ponds in the unincorporated County have received maintenance. Activities included silt removal, clearing, grading, control structure vactoring, fencing, and fence repair. The cost of this activity was $613,628.

Creek Maintenance
In 1999, crews performed maintenance on a number of creeks in unincorporated Pierce County. The work consisted primarily of vegetation management and/or silt removal from designed traps. The work was performed by County maintenance crews as well as our District Court Probation/Detention crews at a cost of $57,644.

Drainage concerns
A total of 285 drainage concerns were entered on the Service Response System for Water Programs. By the end of 1999, 153 had been closed with resolution, 42 had been closed with no resolution, and 90 remained active problems. The majority of the concerns related to private flooding and drainage system failures,

but also included blocked ditches, roadway flooding and blocked culverts. A total of $107,734 was spent on this activity.

Vegetation Control and Plantings (Riverine areas)
Vegetation control is multi-benefit. We must keep access ways clear of unruly and/or non-indigenous vegetation for maintenance crew activities, as well as for avoidance of structural damage to the levee and flood abatement structure. This work must be accomplished with compliance to tribal agreements and regulatory codes, while also maintaining vegetation that is conducive and beneficial to the fisheries resource. This work continues on a yearly basis.

District Court Probation/Detention Crew
In 1999, Pierce County Water Programs utilized crews to assist in pond clearing and brushing, trash pickup, demolition and disposal of floodprone homes and property, creek and ditch clearing and/or enhancement at a cost of $77,500.

15,896 labor hours in 1999 at $10/hr is $158,960 worth of work at a cost of $77,500.

Operation and Maintenance of Streets and Roads
Maintenance activities
Table 3 gives the maintenance functions related to water quality which were performed by Roads in 1999.

Nature and number of inspections in response to complaints
Through the Service Response System (SRS), Road Operations Engineering field staff reviewed 260 complaints dealing with drainage system failure (67%) flooded roadways, blocked ditches and culverts, and trash and debris. Complaints were resolved by Road Operations field crews relieving blockages and cleaning conveyance systems. More complex issues were resolved through engineering designs for updating/repairing existing systems.

Number of inspections of permanent BMPs
Situations are minimal dealing with the construction of permanent BMPs since Road Operations is primarily maintenance oriented. We have installed erosion blankets, rock-lined channels, hydroseeding and oil/water separators as part of our maintenance program. These are inspected during construction and after construction for performance. The number of these type of installations amount to approximately 150 per year County-wide. Roads did purchase a machine that makes continuous sandbags or pebble bags that can be used as berms or temporary erosion and sedimentation control.

Vegetation management program
Soil Residual Herbicides: We are continually evaluating the program for cuts to the application quantities. The previous two years, this program has cut application quantities by 5% and this year we plan on reducing output to 1500 acres, which is an additional 9%. With concerns on the use of Diuron brought up by King County, City of Seattle, and Washington Toxics Coalition, Pierce County Roads has been evaluating the use of Milestone when the federal label is approved. This chemical is environmentally engineered to be more "water friendly" and achieve the same or better results. This will also reduce the amount of active ingredient placed on road shoulders.

Brush Control Herbicides: Aggressive activity on Scotchbroom and Blackberry over the past several years is allowing us to adequately control problem vegetation along road right-of-ways while applying less herbicides. We have reduced brush control herbicide output by 10% over the past couple of years. We will voluntarily reduce the use of chemicals around sensitive areas necessary in preserving habitat and water quality for Salmon.

Noxious Weed Control: Noxious Weeds continue to be a serious threat to health and safety around Puget Sound. Aggressive response to these plants can preserve critical habitat for aquatic life as well. Thus, we will continue to aggressively control noxious weeds within Pierce County using the most effective WSDA/EPA approved herbicides for the plants required for control.

Owner Maintain Program: We continue to see an increase in the response to the program with annual increases of about 10-15% in agreements signed. This also reduces herbicides used within the right-of-way by approximately 3 acres annually. Signs are printed bi-annually for distribution to the road shops with costs ranging from $1200-$1500.

Research: We will continue to evaluate alternatives to herbicides using geo-fabrics, grasses, and native/non-native vegetation. In 2000 we have budgeted a hydro-seeder which will allow us to revegetate all disturbed areas, reducing erosion potential within maintenance activities.

Vactor waste disposal
In 1999, the Roads division finished up research begun in 1998 as to the type of vactor waste facilities most suitable for the County. A design utilized by other municipalities and approved by Ecology was decided upon, and 3 facilities were budgeted to be constructed in the summer of 2000.

Pit management
Road Operations has begun an aggressive program to recycle waste materials and better manage material use within our pit sites Countywide. The sites are being brought up to Health Department standards and managed to prevent the

uncontrolled "dumping" of waste materials. In all 6 pits will be fully brought up to standards in 2000 and another 6 in 2001.

Endangered Species Act
With a final draft in hand and expected adoption by National Marine Fisheries, the Tri-County maintenance proposal will be implemented this year. Activities covered within the proposal are BMP's and conservation outcomes relating to all maintenance actions within Road Operations to preserve habitat and water quality. Other items include extensive training in implementation and monitoring of BMP's and how they relate to the ESA and water quality, research into effective siltation control, and BMP manual for use by road shop personnel. Adaptive management will be utilized by Road Operations in evaluating new products and changing the program to get the most effective results in preserving water quality and fish habitat.

GIS/GPS:
We have started a joint effort with Water Programs to inventory all drainage features within the County. We are focusing on using this information to maintain a database that can schedule maintenance activities within drainage systems. When operational this fall, we can begin to manage drainage maintenance in a pro-active instead of the reactive mode utilizing inspection and maintenance records from past maintenance activities.

Watershed-wide Coordination Activities
Pierce County continued to meet quarterly with the other NPDES permittees. The advent of ESA issues have caused King, Pierce, and Snohomish Counties, and the cities within them, to initiate coordination efforts that go far beyond what was required for NPDES, and which will greatly benefit research and information in the water quality arena. A watershed coulcil is very active in the Puyallup WRIA, and others are being formed as indicated in the **Watershed Planning** section above.

Adequate Information to Conduct Planning, Priority Setting and Program Evaluation Activities
The year 1999 was extremely productive for Pierce County in terms of continuing to improve mapping. A digital ortho flight was done for the entire County in 1998, expanding our mapping from just the urban areas. This mapping continued to undergo field verification for all drainage structures in 1999. Twelve departments spent approximately $800,000 for the ortho effort in 1998-1999, and an additional $350,000 for the drainage verification in 1999.

Water Programs had 1FTE that was devoted strictly to mapping in 1999.

Pesticide Management
In addition to the activities outlined by Roads, Pierce County Parks and Recreation continued to follow the practices as outlined in the SWMP. Parks

realizes that with ESA and NPDES water quality issues, better studies and information, continued training and improved materials, and more manual labor sources (District Court Crew and Purdy Treatment Center Work Crews), they will continue to improve both application and non-application processes.

In 1999, Parks coordinated closely with Roads on compiling the type of information needed to keep track of pesticide use. The result is Table 4, which will be a useful tool in tracking decreases in usage. Table 5 indicates the training classes attended by Parks staff.

Conservation Futures

With a clarification of state law, this fund was able to collect monies in 1999, which are then spent in the following year. A total of $2.2 million was collected in 1999, and the acquisitions planned for 2000 include streambank and upland on Clover Creek, and acreage in the floodplain along the Puyallup River.

Pierce County Conservation District and Stream Team

Water Programs continued to fund basic operations for the PCCD and Stream Team. The PCCD continued to leverage this money into additional funding via grants. A copy of their 1999 Annual Report is provided with this document. The levels of cooperation and partnering have been outstanding.

Stream Team continues to act as an important educational tool for the county. Citizen involvement has been growing steadily, as people develop a sense of stewardship for the streams in their neighborhoods. This interest is expected to grow as ESA issues become more prominent in the public eye. The PCCD has 2.5 FTE coordinating the activities of the Stream Team.

Stream Team activities for 1999 are included in the report mentioned above.

Financial Summary

A summary of all the financial items mentioned in this report are summarized in Table 6.

TABLE 1: 1999 CIP Expenditures

Project Description	Current Status	1999 Expenditure
D320 – Pacific Ave & 106th St. E Pipeline. Prevent flooding of mixed residential, commercial & light industrial area.	Mostly constructed in 1999, completed in 2000	$379,524
D329 – South Hill Pump Station – Pump excess storm water from pothole areas directly to the Puyallup River to prevent flooding of residences and county roads.	Working of final design. Land acquisition and survey complete. Construction to begin in 2000.	$221,012
D806 – Quail Run – Install additional conveyance systems and enlarge existing detention ponds to eliminate residential flooding and downstream erosion. System includes a compost filter for water quality treatment.	Constructed 1999. Complete.	$740,977
D303 – North Fork Clover Creek Detention Pond. Major detention pond (100 acre-feet) to prevent downstream erosion, flooding and habitat degradation. Includes large in-pond wetland area.	Major construction completed in 1999. Wetlands establishment to continue in 2000.	$2,446,248
D319 – Sand Pit Pond – Construct infiltration pond to prevent flooding of roads and residences in pothole area.	In final design. Land acquisition and Survey complete. Construction scheduled for 2000	$42,860
D325 – Afdem Regional Retention Pond – Convert old gravel pit into regional infiltration pond. Will allow County to resolve numerous drainage problems within the area.	Constructed 1998. Minor items to complete project in 1999.	$305,950
D327 – W-1 Pond. Construct an 80 acre-ft pond on major tributary of Clover Creek to reduce downstream flooding and erosion	In final design. Survey and land acquisition complete. Begin construction in 2000.	$193,378
D147 – Lower Meridian (144th St. E & SR-161) Expand capacity of existing infiltration facility to eliminate flood caused closure of highway.	Design in 1999. Construct in 2000	$20,093
D149 – 146th & 80th St. E. Pipeline. Enlarge existing pipesystem leading to the Puyallup River to eliminate flooding of roadway and residences.	In final design. Construct in 2000.	$22,051
D144 – 192nd St. E. & 22nd Ave.	Design and land acquisition.	$23,589

OUTFALLS INVESTIGATED 19[illegible] TABLE 2.

DATE	OUTFALL ID NO.	LOCATION	S-T-R	PIPE SIZE	FLOW	FIELD ANALYSIS	FIELD OBSERVATION	DISCHARGE LOCATION	LAND USE	FIELD DESCRIPTION	PIPE Material	COMMENTS
6/25/99	051903-01	1200 Block of 102nd Ave S.	05--19--03	27"	NO	NONE	Excessive growth site needs maintenance	Clover Creek	Residential	Open Channel	CMP	
6/25/99	141903-01	25th Ave E. (South side of bridge)	14--19--03	21"	NO	NONE		Clover Creek	Residential	Outfall	CCP	
6/16/99	201904-01	160th St. E.(between 83rd & 84th Ave E	20--19--04	24"	NO	NONE	Sediment observed in pipe-needs maintenance	Wetland	Residential	Outfall	CMP	Excessive growth-pipe has corrosion
6/16/99	201903-01	Military Road & Spanaway Park	20--19--03	28"	NO	NONE		Morey Creek	Residential	Outfall	CCP	
6/16/99	201904-01	147th St Ct E. & 70th Ave Ct E.	20--19--04	21"	NO	NONE	Maintenance needed around pipe	Retention Pond	Residential	Outfall	CCP	Additional rip-rap required to prevent scouring
6/17/99		Peninsula Hwy at Filucy Bay		21"	NO	NONE	Excessive growth site needs maintenance	Retention Pond	Residential	Outfall	HDPE	Pipe runs across from Longbranch Mercantile
6/17/99	182002-01	End of Queen's Dr. Fox Island	18--20--02	18"	NO	NONE		Puget Sound	Residential	Outfall	HDPE	
6/17/99	022101-01	9200 block of S. Vaughn Rd, KPN	02--21--01	18"	YES	NONE	2" to 3" of sediment inside pipe	Vaughn Bay	Residential	Outfall	CCP	Flow too low for analysis
6/18/99	161903-02	"C" St. S. between 130th St & 132nd St. S.	16--19--03	18"	NO	NONE		Clover Creek	Residential	Outfall	CCP	Outfall located under bridge
6/18/99	161903-03	Bridge between 132nd St S. & 130th St Ct S.	16--19--03	18"	NO	NONE		Clover Creek	Residential	Outfall	CCP	On "C" St. S./South side of Clover Creek
6/18/99	161903-01	South of 132nd St. on Pacific Ave	16--19--03	37"	NO	NONE	Excessive growth site needs maintenance	Clover Creek	Commercial	Outfall	CMP	Next to S & S Tires
6/18/99		13th Ct off Pilchuck Way, Fox Island		12"	NO	NONE		Puget Sound	Residential	Manhole	CCP	
6/18/99	352101-01	7th Ave & Chinook Dr, Fox Island	35--21--01	12"	NO	NONE		Hales Passage	Residential	Outfall	CCP	
6/18/99		Across from mail box of address 897 Fox Dr		10"	NO	NONE	Outfall is made of white plastic pipe	Hales Passage	Residential	Outfall	HDPE	
6/19/99	041903-04	19600 Broadway Ave S.	04--19--03	32"	NO	NONE	Pipe has corrosion	Clover Creek	Residential	Outfall	CMP	
6/20/99	282002-01	72nd St. E. & Roosevelt Ave	28--20--02	48"	NO	NONE	Excessive growth site needs maintenance	Chambers Creek	Residential	Open Channel	CCP	Outfall behind Texaco station at 84th & Canyon
6/23/99		Across from 314 Butte Ave SE @ Butte Pit		(2) 42"	YES	NONE	North end of pipes are partially blocked with decayed vegetation/Sediment build-up	White River	Industrial/Resid	Outfall	CCP	Outfall is located at Government Canal
6/23/99	172102-01	On Reid Dr NW across from 42nd St. Ct NW	17--21--02	21"	NO	NONE	Outfall discharges parallel to holly Ln outfall on beach	Puget Sound	Residential	Outfall	HDPE	Accessed beach through private property
6/23/99	212102-01	Holly Ln NW	21--21--02	18"	NO	NONE	Holly Ln outfall # runs parallel to 4200 Reid Dr NW pipe/outfall, discharges on beach	Puget Sound	Residential	Outfall	HDPE	Outfall discharges onto beach below
6/24/99	362101-01	Cromwell Dr NW-Multiple outfalls	36--21--01	12"	YES	NONE		Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	362101-02	Cromwell Dr NW-Multiple outfalls	36--21--01	12"	Trickle	NONE	Barnacles located inside of pipe	Hales Passage	Residential	Outfall	concrete Bulkhead	Flow too low for analysis
6/24/99	322101-03	Cromwell Dr NW-Multiple outfalls	36--21--02	12"	NO	NONE		Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-04	Cromwell Dr NW-Multiple outfalls	36--21--03	12"	NO	NONE		Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-05	Cromwell Dr NW-Multiple outfalls	36--21--04	12"	YES	NONE	Barnacles and algae located inside bulkhead	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-06	Cromwell Dr NW-Multiple outfalls	36--21--05	12"	Trickle	NONE	Algae located inside of pipe	Hales Passage	Residential	Outfall	concrete Bulkhead	Flow too low for analysis
6/24/99	322101-07	Cromwell Dr NW-Multiple outfalls	36--21--06	12"	YES	NONE	Algae located inside of pipe	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-08	Cromwell Dr NW-Multiple outfalls	36--21--07	12"	YES	NONE	Algae located inside of pipe	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-09	Cromwell Dr NW-Multiple outfalls	36--21--08	12"	NO	NONE		Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-10	Cromwell Dr NW-Multiple outfalls	36--21--09	18"	YES	NONE	Barnacles and algae located inside bulkhead	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-11	Cromwell Dr NW-Multiple outfalls	36--21--10	12"	YES	NONE		Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-12	Cromwell Dr NW-Multiple outfalls	36--21--11	21"	NO	NONE	Pipe is 1/3 filled with rocks from tidal action/Concrete cracking	Hales Passage	Residential	Outfall	concrete Bulkhead	Algae observed inside pipe
6/24/99	322101-13	Cromwell Dr NW-Multiple outfalls	35--21--12	12"	YES	NONE	Sediment and rocks observed in pipe	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-14	Cromwell Dr NW-Multiple outfalls	35--21--13	12"	Trickle	NONE	Algae located inside of pipe	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/24/99	322101-15	Cromwell Dr NW-Multiple outfalls	36--21--14	18"	NO	NONE	Barnacles and algae located inside bulkhead	Hales Passage	Residential	Outfall	concrete Bulkhead	
6/2/99	171901-01	12508 Eckenstam-Johnson Rd., Anderson Island	17--19--01	12"	YES	NONE	Outlet not accessable to calculate flow due to HIGH TIDE	Oro Bay	Residential	Outfall	CCP	There is continual flow from spring seepage above
6/2/99	171901-02	Eckenstam-Johnson Road, Anderson Island	17--19--01	18"	NO	NONE	Excessive growth site needs maintenance	Oro Bay	Residential	Outfall	CCP	Outfall near mail box labled Oro Bay Mercantile
6/2/99	171901-03	12024 Eckenstam-Johnson Rd, Anderson Island	17--19--01	12"	NO	NONE	There is minor corrosion at the bottom of the pipe at the effluent end	Oro Bay	Residential	Outfall	CMP	
6/2/99	171901-04	Intersection of Brandt Rd & Eckenstam-Johnson Al	17--19--01	12"	NO	NONE	Discharge end of pipe exposed approximately 6' - 7' with no support holding it in place	Oro Bay	Residential	Outfall	CMP	
6/2/99	171901-05	Eckenstam-Johnson Road, Anderson Island	17--19--01	8"	NO	NONE	Pipe (conveyance) filled with sediment and unable to locate discharging end	Oro Bay	Residential	Outfall	CMP	Outlet needs maintenance
6/2/99	171901-06	Eckenstam-Johnson Rd (13110 nearest address)	17--19--01	12"	NO	NONE	Pipe extended out 6' - 7' at effluent and with no support to hold it in place	Oro Bay	Residential	Outfall	CMP	
6/2/99	171901-07	Intersection of Brandt Rd & Eckenstam-Johnson Al	17--19--01	12"	NO	NONE	Outfall BADLY needs maintenance due to corrosion/Also scouring underneath pipe	Oro Bay	Residential	Outfall	CMP	Excessive growth-pipe has corrosion
6/2/99	171901-08	12618 Eckenstam-Johnson Rd, Anderson Island	17--19--01	12"	NO	NONE		Oro Bay	Residential	Outfall	CMP	
6/2/99	171901-09	Eckenstam-Johnson Rd in area of 13110	17--19--01	12"	NO	NONE	BLACKBERRY VINES!!!! Could not locate discharge end of pipe	Oro Bay	Residential	Outfall	CMP	Excessive growth
6/2/99	171901-10	In the area of 13110 Eckenstam-Johnson Rd	17--19--01	12"	NO	NONE		Oro Bay	Residential	Outfall	CMP	
6/2/99	171901-11	Eckenstam-Johnson Rd (near 12312)	17--19--01	18"	NO	NONE		Oro Bay	Residential	Outfall	CCP	
6/14/99	081903-01	S. 112th St near Ehli's Auto Auction	08--19--03	30"	NO	NONE	There is rock and gravel filling approximately 15%-20% of effluent end of culvert(S.END)	Wetland	Residential	Outfall	CCP	Site needs maintenance
9/15/99	221903-02	152nd St E. & 18th Ave Ct E (can see from 152nd)	22--19--03	18"	YES	YES	Noticed a slight chlorine odor coming from outlet	Detention Pond	Residential	Outfall	CMP	Chlorine (TOTAL) .6mg/l
9/15/99	221903-01	150th St E. & 18th Ave Ct. E (Mia Valley Division 2)	22--19--03	18"	NO	NONE	Metal sleve inside concrete pipe has a debris cage/screen	Detention Pond	Residential	Outfall	CCP	
6/16/99	052002-01	South end of Point Fosdick Road (on the beach)	05--20--02	18"	YES	NONE		Puget Sound	Residential	Outfall	CCP	Site is at the end of the culdesac
6/16/99	122101-01	55th Ave Ct NW & 54th Ave NW Rosewood Develop.	12--21--01	18"	NO	NONE	Pond recently cleared of vegetation	Detention Pond	Residential	Outfall	CCP	
6/16/99	352101-01	Northshore Blvd off of 6th Ave, Fox Island	35--21--01			NONE	Difficult to assess flow due to high tide	Hales Passage	Residential	Outfall		Barnacles and algae observed attached to outfall
6/16/99	352101-02	Northshore Blvd off of 6th Ave, Fox Island	35--21--01	12"	YES	NONE		Hales Passage	Residential	Outfall	CCP	
6/16/99	352101-03	Northshore Blvd off of 6th Ave, Fox Island	35--21--01	18"	NO	NONE	Barnacles attached inside and outside of pipe	Hales Passage	Residential	Outfall	CCP	Barnacles and algae observed attached to outfall
6/17/99	242101-01	68th Ave Ct NW & 38th St Ct NW	24--21--01	15"	NO	NONE	Fencing has been cut and section missing/Children set-up bike track inside	Artondale Creek	Residential	Outfall	CCP	Pipe has cracking concrete/site needs maintenance
6/17/99	232101-01	36th St Ct NW (easement) between homes 7513 & 7515	23--21--01	18"	NO	NONE	Outfall COMPLETELY blocked with sediment	Retention Pond	Residential	Outfall	CCP	Site needs maintenance
6/17/99	232101-01	37th St Ct NW (easement) between homes 7513 & 7515	23--21--01	12"	NO	NONE		Retention Pond	Residential	Outfall	CCP	
6/17/99	232101-02	d of Swanson Dr NW-Easement between homes 7724 & 7	23--21--01	18"	NO	NONE	Culvert filled 1/3 full of gravel and sand-Fencing needs maintenance	Detention Pond	Residential	Outfall	CCP	
6/17/99	262101-01	Fairwind Ln and Warren Dr NW	26--21--01	24"	YES	NONE		Hales Passage	Residential	Outfall	CMP	
6/23/99	021903-01	97th St E. between 9th Ave E. & McKinley Ave E.	02--19--03	52"	NO	NONE	Culvert 1/3 full of sediment and debris/North end of channel needs debris removed	Swan Creek	Residential	Outfall	CCP	Site needs maintenance/Inhibited growth
6/23/99	142101-01	In front of 7625 Artondale Dr NW	14--21--01	18"	YES	NONE	Flow too low for analysis	Artondale Creek	Residential	Outfall	CCP	
6/30/99	081903-02	1900 Block of 116th St South	08--19--03	24"	NO	NONE	Culvert approximately 90% blocked with stones and gravel	Wetland	Residential/Co	Outfall	CCP	Inhibited growth-Site needs maintenance
6/30/99	081903-01	112th Street South & Steele Street South	08--19--03	12"	NO	NONE		Wetland	Residential/Co	Outfall	CCP	
6/30/99	081903-02	112th Street South & Steele Street South	08--19--03	24"	NO	NONE	Pipe filled with approximately 30% of stones and gravel-needs to be removed	Wetland	Residential/Co	Outfall	CCP	Inhibited growth-Site needs maintenance
6/30/99	162103-01	Hyada Blvd- Brown's Point	16-21-03	18"	NO	NONE	End of pipe buried approximately 2' under sand on the beach	Puget Sound	Residential	Outfall	CCP	Unable to inspect discharge end of pipe
6/30/99	031903-01	Golden Givens Rd at 112th St E.	03--19--03	35"		NONE	Unable to access outfall due to high water in pond and excessive vegetation	Retention Pond	Residential/Co	Outfall		

TABLE 3.

1999 MAINTENANCE FUNCTIONS				
FUNCTION	Measurement	PLANNED	ACTUAL	$$ SPENT
Ditching with backhoe	Ditch feet	126,771	57,930	$ 215,444.00
Ditching with drott	Ditch feet	31,758	36,558	$ 68,742.00
Beltloading	Ditch mile	220	188	$ 254,671.00
Manually clean culvert ends	Each	9,118	5,461	$ 30,793.00
Mechanically clean culvert ends	Each	1,202	833	$ 26,494.00
Grate tops cleaned	Each	2,078	2,884	$ 13,365.00
Mechanically clean catch basins	Each	4,995	6,785	$ 156,160.00
Jet rodding	Lin. feet	161,492	181,442	$ 151,572.00
Repair/replace culvert pipe	Lin. feet	3,214	7,130	$ 327,043.00
Repair/replace catch basin	Labor hour	720	1,799	$ 97,626.00
Repair/replace drywells	Labor hour	801	695	$ 59,523.00
Erosion control repair	Labor hour	1,012	1,075	$ 56,519.00
Holding ponds	Each	27	17	$ 34,284.00
Ditching with Ditchmaster	Ditch mile	270	202	$ 238,072.00
Self containd street sweeping	Cntr.lane mile	3,374	2,269	$ 220,042.00
Misc. drainage repair	Labor hour	4,859	11,378	$ 456,882.00
Litter removal	Labor hour	1,405	5,164	$ 186,340.00
				$ 2,593,572.00

TABLE 4

PESTICIDES AND FERTILIZERS
CURRENTLY USED W/IN THE PIERCE COUNTY PARKS SYSTEM

Parks Division

Responsible for the parks under our jurisdiction in unincorporated Pierce County not including the recreation centers and golf courses

	EPA Signal Word	Tier
Round-Up Pro	Caution	2
Weedmaster	Danger	1
Garlon	Danger	1
Crosbow	Caution	1
Metasystox - R2	Warning	
Turfco 18-3-18	Fertilizer	

Recreation Centers Division

Responsible for the fields and grounds at our two recreation centers.

Round-Up Pro	Caution	2
Finale	Warning	1
Norsac	Caution	1
Diazanon	Caution	1
Metasystox - R2	Warning	
Turfco 18-3-18	Fertilizer	
Ferromac AC Liquid Iron	Fertilizer	
Rhododendron Fertilizer	Fertilizer	
Hydrated Lime	Fertilizer	

Grounds Division

Responsible for grounds maintenance around many of the County Administrative buildings

Round-Up Pro	Caution	2
Finale	Warning	1
Surflan	Caution	2
Trimec	Danger	1
Chlorpyrifos 2 32G Insecticide	Caution 1	
Daconil Fungicide 5%	Danger 1	
DI-Syston	Danger	
Metasystox - R2	Warning	
Ronstar G	Warning	1
Dormant Spray	Caution	2
Slippery Water G	Wetting Agent	
Turfco 18-3-18	Fertilizer	
6-20-20	Fertilizer	

Golf Division

Responsible for the two golf courses under our jurisdiction

	EPA Signal Word	Tier
Daconil 2787	Danger	1
Cleary's 3336	Caution	2
Systec	Caution	2
Fore	Caution	1
Heritage	Caution	1
Bayleton	Caution	1
Chipco 26019	Caution	1
Trimec	Warning	1
Super Trimec	Danger	1
Round-Up	Caution	2
Surflan	Caution	2
Triclopyr (Confront)	Danger 1	
Primer	Wetting Agent	
Scott's 19-3-19	Fertilizer	
Nutriculture 24-4-8	Fertilizer	
Nutriculture 20-20-20	Fertilizer	
Feromec	Fertilizer	
Scotts 30-3-9	Fertilizer	
Turfco 18-3-18	Fertilizer	
Peters Solubles	Fertilizer	
Scott's Contec	Fertilizer	
Hydrated Lime	Fertilizer	

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PIERCE COUNTY PARKS
Pesticides and Fertilizers

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	Total Acreage	Treated Acres	Appl. Rate/Acre	# Appl. Per Year	Total Amt Per Year	Description of treated areas
PARKS DIVISION	**867**					
Fertilizer 18-3-18 30% SCU					Pounds	
(50# bag)						
Eatonville Playfield		15	65	1	975	Mowed grass areas
Frontier Park		12	65	2	1,560	Mowed grass areas
Ft. Steilacoom Park		12	65	2	1,560	Sports fields
Gonyea Playfield		12	65	4	3,120	Mowed grass areas
Lake Tapps Park		8	65	2	1,040	Mowed grass areas
Lidford Playfield		10	65	2	1,300	Mowed grass areas
Mayfair Playfield		4	65	2	520	Mowed grass areas
Spanaway Park-Islands		2	65	2	260	Mowed grass areas
Spanaway Park-Phy Fit		10	65	2	1,300	Mowed grass areas
Western State Ballfield		4	65	3	780	Ballfield
Fertilizer Trimec LM Weed & Feed 18-3-5					Pounds	
(35# bag)						
Spanaway #4 PL Bank		0.5	70	1	35	Formal lawn areas
Spanaway House		0.25	70	2	35	Formal lawn areas
Spanaway Park-Entrance		1	70	2	140	Formal lawn areas
Herbicides						
Round-Up Pro					Ounces	
(1 oz/128 oz of water)						
Eatonville Playfield		0.74	43.5	1	32	Fence line, parking lot
Frontier Park		0.25	43.5	3	32	Fence lines, landscaping
Ft. Steilacoom Park		2.94	43.5	2	256	Athletic field lining, edge curbs, sidewalks, etc.
Gonyea Playfield		0.41	43.5	1	18	Athletic field lining, edge curbs, sidewalks, etc.
Lake Tapps Park		0.25	43.5	3	32	Curbs, parking lot, noxious weeds
Lidford Playfield		0.41	43.5	1	18	Curbs, baseball field, fence line
Mayfair Playfield		0.57	43.5	1	25	Curbs, baseball field, fence line
Orange Gate Property		0.69	43.5	1	30	Spot spray for noxious weeds
Rimrock Park		0.74	43.5	1	32	Spot spray for noxious weeds
Spanaway Park		2.07	43.5	1	90	Curbs, fence lines, pathways (3.5 miles x 6")
Western State Ballfield		0.37	43.5	2	32	Athletic field lining, fence lines

PIERCE COUNTY PARKS
Pesticides and Fertilizers

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	Total Acreage	Treated Acres	Appl. Rate/Acre	# Appl. Per Year	Total Amt Per Year	Description of treated areas
Weedmaster						
(2 oz/128 oz of water)						
Spanaway Park		0.23	87	1	20	Spot spray for noxious weeds
Ft. Stellacom Park		0.09	87	4	32	Spot spray for noxious weeds
Orange Gate Property		0.17	87	2	30	Spot spray for noxious weeds
Swan Creek Property		0.23	87	1	20	Spot spray for noxious weeds
Rimrock Property		0.37	87	1	32	Spot spray for noxious weeds
GOLF DIVISION	**265**					
Fertilizers						
18-3-18 Large Prill		90	100	1	9,000	Fairways & Irrigated Roughs
30-3-9 + Fe		90	125	2	22,500	Fairways & Irrigated Roughs
Hydrated Lime		90	50	0.5	2,250	Fairways & Irri. Roughs (every other year)
18-3-18 Medium Prill		4	250	3	3,000	Tees & surrounds
18-9-18 Medium Prill		4	250	3	3,000	Tees & surrounds
18-9-18 Small Prill		4	250	6	6,000	Greens & surrounds
N-Sure 21-0-0		6	1	3	18	Greens & surrounds (1 gal/acre +/-)
Nutriculture 28-8-18 + minors		6	20	3	360	Greens & surrounds (20 lbs/acre +/-)
or Peters 20-5-30 + minors						
Ferromec 12-0-0 + Fe		6	1	3	18	Greens & surrounds (1 gal/acre +/-)
or Feature 12-0-0 + Fe						
Primo Wetting Agent		6	0.5	12	36	Greens & surrounds (.5 gal/acre +/-)
Spreader/Sticker Activator 90		6	0.25	12	18	Greens & surrounds (.25 gal/acre +/-)
FFII+ 14-3-3		6	100	2	1,200	Greens (100 lbs/acre +/-)
Herbicides						
Cool Power *or* Confront		18	0.25	2	9	Fairways & Irri. Roughs (.25 gal/acre)
Round-Up Pro		1.5	1.5	1.5	3	Fairways & Irri. Roughs (1-2x years/1-2 acres)
Surflan		1.5	0.75	1	1	Flower beds
Super Trimec		5	0.5	1	3	Irrigated roughs
Fungicides						
Fore Flowable		6	1	4	24	Greens (1gal/acre)
aconil 2787 *or* Cleary's 3336		6	2	2	24	Greens (2gal/acre)
Chipco 26019		6	1	1	6	Greens (1gal/acre +/-)
Systec		6	1	1	6	Greens (1gal/acre +/-)
Heritage		6	0.3	1	2	Greens (.3 lbs/acre +/-)

PIERCE COUNTY PARKS
Pesticides and Fertilizers

3/31/2000 13:12

	Total Acreage	Treated Acres	Appl. Rate/Acre	# Appl. Per Year	Total Amt Per Year		Description of treated areas
REC CENTERS DIVISION	**110**						
Fertilizers					Pounds		
18-3-18 30% SCU		35	65	4	9,100		Sports fields
18-3-18 30% SCU		4	65	4	1,040		Formal lawns
Herbicides					Gallons		
Confront		10	0.25	1	3		Spot spray for broadleaf weeds
Round-Up Pro (2oz/gal)		2.8	0.68	4	7.5		Fence lines, ballfield lining
Norsac		0.5	50	4	100	lbs	Flower beds and warning track
GROUNDS DIVISION	**80**						
Fertilizers							
18-3-18 30% SCU		6	65	10	3,900		Formal lawns
Best 6-20-20		10	100	2	2,000		Perennial flower beds & roses
Slippery Water G		0.334	150	2	100		Wetting agent for formal lawns, spot treatment
Herbicides					Gallons		
Trimec		0.5	0.68	3	1		Formal lawns, Spot spraying
Round-Up Pro		4	1.25	1	5		Curbs, pavements, beds, spot spraying
Ronstar G		0.5	60	1.5	45	lbs	Flower beds, spot treating
Surflan		4	0.33	2	3		Hard surfaces, curbs, edges, spot spraying
Fungicides					Pounds		
Daconil 2787 G		0.334	150	1	50		Formal lawns, spot treatment
insecticides					Pounds		
Di-Syston		0.05	40	2	4		Roses, systemic insecticide
Metasystox		0.2	10	2	4		Trees, systemic insecticide
Chlorpyrifos 2.3G		2	25	1	50		Formal lawns, spot treatment

PIERCE COUNTY PARKS
Pesticides and Fertilizers

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	Total Acreage	Treated Acres	Appl. Rate/Acre	# Appl. Per Year	Total Amt Per Year	Description of treated areas
	1,322		varies	varies		
Fertilizers		241.75				
Granular (tons)					37.81	
Liquid (gallons)					90	
Pesticides		57.71				
Granular (pounds)					253	
Liquid (gallons)					103.2	

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Table 5. 1999 Training for Pierce County Parks

	# Hours	Cost
Water/Well Training Class		
Dennis Bilderback	8 hours	214.00
Edwin Ivey	8 hours	214.00
Athletic Field / Sport Turf Workshop		
Becky Little	8 hours	253.00
Gerry Olson	8 hours	221.00
Dennis Pelham	8 hours	253.00
Northwest Turfgrass Association Conference		
Rick Hults	32 hours	1,921.70
Andrew Soden	32 hours	1,925.00
Pesticide Classes		
Parks employees	(22) 200 hours	5,652.00
Golf Coursees (6)	96 hours	2,685.00
Cost of study materials		94.60
Turf & Ornamental Seminar (Pesticide/Herbicide/Fertilizer Regs.)		
Andrew Soden	8 hours	285.00
Todd Mitchell	8 hours	212.50
Scott Tyson	8 hours	212.50
USGA Regional Green Section Conference (IPM)		
Andrew Soden	8 hours	311.00
Washington Turf & Landscape Show (Pesticide credits)		
Toby Lirot	16 hours	489.00
Andrew Soden	16 hours	633.00
Scott Tyson	16 hours	489.00
WWGCSA Crew Seminar		
Andrew Soden + 3 employees	32 hours	995.00
WWGCSA Superintendents Meetings		
Andrew Soden	6 hours	290.00
TOTALS	**518 hours**	**$17,255.70**

Cost includes salaries.

TABLE 6- 1999 NPDES EXPENDITURES

DEPT/PROGRAM	SWMP COMMITMENT		ACTUAL EXPENDITURE	
	FTE	$	FTE	$
Water Programs				
Capital Improvement Program	7.3	652,000	11	4,551,867
Pond & Creek Maintenance	-	-	6	671,269
District Court Crew	-	-	varies	77,500
NPDES Coordination & Transfer to PALS	.5	48,000	2	337,928
Monitoring	1.1	79,850	.7	52,934
Watershed Planning	2.5	235,100	2.5	303,500
CWSP	1.25	125,000	1.25	123,003
Industrial Inspection	1.7	119,750	.4	18,222
River Improvement Activities				
Buyouts	-	-	Varies	740,328
Garbage Cleanup	-	-	Varies	>69,461
Drainage Investigations	1.6	119,850	1.3	107,734*
Tacoma Pierce County Health Department				
Recreational Shellfish	.1	7800	.15	7,200
On-Site Sewage O&M	2	153,400	1.8	125,000
Wellhead Protection			.3	18,000
Bathing Beach Sampling	-	-	.1	8,000
Groundwater Monitoring	1.5	108,000	1.5	120,000
Compliance Group	2	153,400	3	200,000
Chambers-Clover Management Plan			.2	12,000
Solid Waste	2	153,400	2	143,000
Septic repair grants			1.1	80,000
PALS				
Implementation of Stormwater Management Manual	17	1,289,000	10.5***	700,000 **
Code Enforcement	4	465,700	.25	9,000**
Transportation Services				
Road Design	2	154,000		
Road Maintenance	23.75	1,994,300	24.75	2,593,572

DEPT/PROGRAM	SWMP COMMITMENT		ACTUAL EXPENDITURE	
	FTE	$	FTE	$
Pierce County Conservation District and Stream Team				
	-	-	varies	106,667
Parks and Recreation				
Conservation Futures	1	-	1	2,200,000
Training	-	5,305	-	17,256
Adequate Information				
Mapping	1	66,000	varies	800,000 (98 & 99)
Education				
	1	60,000	4	263,607

*Does not include PALS figures, which is wrapped into their budget.
**Difference in amounts as a result of better accounting allowing designation of NPDES functions only.
***FTE does not include people hired by contract from 4 engineering firms.